

Remarks

Claims 1-36 were pending in this application before this Amendment A. Claims 17-24 and 27-32 have been allowed, claims 1-5, 8-10, 25, 26 and 33 stand rejected, and claims 6, 7, 11-16 and 34-36 have been objected to. Claims 5-7, 9-12, 17-24, 26-32 and 34-36 are submitted herewith in Appendix A, a Submission of Marked Up Claims, in accordance with 37 C.F.R. §1.121.

Applicants respectfully request reconsideration of the rejection of Claims 1-5, 8-10, 25, 26 and 33 under 35 U.S.C. §103(a) as obvious over Reinicke (U.S. Patent No. 5,404,908 or 5,450,871).

With respect to claim 1, this claim requires that the controller “comprises a bar extending between the spaced apart operators; and a coil on the bar between the operators”. Reinicke neither describes nor suggests a controller having a bar extending between spaced apart operators. Rather, Reinicke describes a cylindrical magnetic element, which is the central portion of a generally U-shaped core including two spaced downwardly directed magnetic legs. Each of the legs comprising a short cylindrical pole-face and upwardly projected structure that is interconnected by the central portion. In Reinicke, the two spaced downwardly directed magnetic legs are part of the U-shaped core. Conversely, the spaced apart operators of the present invention are not part of the core, but rather are movable upon energizing a coil wound on a core. (see page 3, lines 6-19). Additionally, Reinicke neither teaches or suggests a coil on the bar between the operators. Rather Reinicke describes a central portion of a generally U-shaped core including two spaced downwardly directed magnetic legs. Each of the legs interconnected by the central portion about which a coil is developed. The coil in Reinicke is wound around the central portion of a U-shaped core between two legs of the core, while the coil of the present invention is described to be wound around a bar between spaced apart operators that are not part of the core.

Furthermore, Applicants submit that, in view of Reinicke, it would not have been an obvious design choice to construct a single coil, two operator controller including a bar extending between spaced apart operators and a coil wound on the bar.

Obviousness cannot be established by merely suggesting it would have been obvious to one of ordinary skill in the art to have selected an alternative design choice.

Furthermore, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such a reference fairly suggests to one of ordinary skill in the art. For at least these reasons, Applicants submit that claim 1 is patentable over Reinicke.

With respect to claim 2, this claim requires that the controller “comprises a sleeve, having a first end and a second end, generally surrounding each operator, in which the operator can move, and a coil on a bar between the sleeves”. Reinicke neither describes nor suggests a controller including a sleeve surrounding each operator, in which the operator can move, with a coil on a bar between the sleeves. Rather, Reinicke describes a central portion of a generally U-shaped core having two spaced downwardly directed magnetic legs interconnected by the central portion, and a winding developed on the central portion. Conversely, the spaced apart operators of the present invention are not part of the core, but rather are movable within the sleeves upon energizing the coil wound on the core. (see page 3, lines 6-19). Additionally, the coil in Reinicke is wound around the central portion of a U-shaped core between two legs of the core, while the coil of the present invention is described to be wound around a bar between sleeves in which spaced apart operators move.

Furthermore, Applicants submit that, in view of Reinicke, it would not have been an obvious design choice to construct a single coil, two operator controller for simultaneously actuating two spaced apart magnetically responsive operators, wherein the controller includes a sleeve surrounding each operator and a coil on a bar between the sleeves. Obviousness cannot be established by merely suggesting it would have been obvious to one of ordinary skill in the art to have selected an alternative design choice. Furthermore, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such a reference fairly suggests to one of

ordinary skill in the art. For at least these reasons, Applicants submit that claim 2 is patentable over Reinicke.

Claims 3-5 depend, directly or indirectly, from claim 2, shown above to be allowable. Moreover, when the additional recitations of claims 3-5 are considered in combination with the recitations of claim 2, Applicants respectfully submit that claims 3-5 are likewise patentable over Reinicke. More specifically, claim 3 requires that the second ends of the sleeves are closed, and that the bar has a recess for receiving the closed second end of each sleeve. Claim 4 requires that the coil on the bar comprise "first and second winding sections connected in series and separated by a gap." Claim 5 requires "a return" extending substantially between the plate and the bar. These structures are not shown or described in Reinicke, which shows a U-shaped magnet with a single coil at the bottom of the "U".

With respect to claim 8, this claim requires that the gas valve "comprises first and second valve members, each member having an associated magnetically responsive operator and a controller for operating the valve members, the controller comprising a sleeve having first and second ends in which each operator can move to move the valve member, and a bar adjacent to, and extending between the second ends of the sleeves, and a coil on the bar between the sleeves". Reinicke neither describes nor suggests a gas valve having valve members, each having an associated operator and a controller for operating the valve members, wherein the controller includes sleeves in which the operators can move, a plate extending between the first ends of the sleeves, and a bar extending between the second ends of the sleeves, and a coil on a bar between the sleeves. Rather, Reinicke describes a central portion of a generally U-shaped core having two spaced downwardly directed magnetic legs interconnected by the central portion, and a coil developed on the central portion between the two legs. Conversely, the spaced apart operators of the present invention are not part of the core, but rather are movable within the sleeves upon energizing the coil wound on the core. (see page 3, lines 6-19). Additionally, the coil in Reinicke is wound around the central portion of a U-shaped core between two legs of the core, while the coil of the present invention is

described to be wound around a bar between sleeves in which spaced apart operators move.

Furthermore, Applicants submit that, in view of Reinicke, it would not have been an obvious design choice to construct a single coil, two operator controller for simultaneously actuating two spaced apart magnetically responsive operators, wherein the controller includes a sleeve surrounding each operator and a coil on a bar between the sleeves. Obviousness cannot be established by merely suggesting it would have been obvious to one of ordinary skill in the art to have selected an alternative design choice. Furthermore, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such a reference fairly suggests to one of ordinary skill in the art. For at least these reasons, Applicants submit that claim 8 is patentable over Reinicke.

Claims 9-10 depend, directly or indirectly, from claim 8, shown above to be allowable. Moreover, when the additional recitations of claims 9-10 are considered in combination with the recitations of claim 8, Applicants respectfully submit that claims 9-10 are likewise patentable over Reinicke. More specifically, claim 9 (like claim 4 discussed above) requires that the coil comprise "first and second winding sections connected in series and separated by a gap." Claim 10 (like claim 5 discussed above) requires "a return" extending substantially between the plate and the bar. These structures are not shown or described in Reinicke.

With respect to claim 25, this claim requires that the controller "comprises an electrically operated coil, the coil enclosing a portion of magnetic flux conducting rod, the coil and rod thereby being inductively coupled; a first magnetic flux conducting plunger in a spaced apart relation from a first end of the rod, the first plunger being moveable between two positions; a second magnetic flux conducting plunger in a spaced apart relation from a second end of the rod, the second plunger being moveable between two positions; and a magnetic flux conducting divider having opposite sides and separating the coil into first and second windings". Reinicke neither describes nor

suggests a controller having a coil inductively coupled to a rod in spaced apart relation to a first plunger and a second plunger. Rather Reinicke describes a central portion of a generally U-shaped core including two spaced downwardly directed magnetic legs with a single coil on the bottom of the "U". Each of the legs interconnected by the central portion about which a coil is developed. Conversely, the coil of the present invention is described to be inductively coupled to a rod in spaced apart relation to a first and second plunger. Additionally, Reinicke neither describes nor suggests a controller having a magnet flux conducting divider having opposite sides and separating the coil into first and second windings. Rather, Reinicke describes a single electrical winding developed around a central portion of a U-shaped core, wherein exciting the winding concurrently opens two valves.

Furthermore, Applicants submit that, in view of Reinicke, it would not have been an obvious design choice to construct a single coil controller including an electrically operated coil enclosing a magnetic flux conducting rod, a first magnetic flux conducting plunger, a second magnetic flux conducting plunger and a magnetic flux conducting divider that separates the coil into a first and second winding. Obviousness cannot be established by merely suggesting it would have been obvious to one of ordinary skill in the art to have selected an alternative design choice. Furthermore, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such a reference fairly suggests to one of ordinary skill in the art. For at least these reasons, Applicants submit that claim 25 is patentable over Reinicke.

Claims 26 depends directly from claim 25, shown above to be allowable. Moreover, when the recitations of claim 26 are considered in combination with the recitations of claim 25, Applicants respectfully submit that claim 26 is likewise patentable over Reinicke. More specifically, claim 26 requires a "bobbin". No such bobbin is shown in Reinicke.

With respect to allowed claims 27-32, claims 27-32 have been amended to depend, directly or indirectly from claim 25, which stands rejected. However, claim 25

has been submitted to be patentable over Reinicke. Thus, when the recitations of claims 27-32 are considered in combination with the recitations of claim 25, Applicants respectfully submit that claims 27-32 are likewise patentable over Reinicke.

With respect to claim 33, this claim requires the method “comprises providing a magnetic flux conducting core with laterally opposite first and second ends; enclosing a portion of the core with a an electrically operated coil, the coil comprised of an electrically conducting wire, the wire winding around a first section of the core and a second section of the core; placing a magnetic flux conducting divider adjacent the core between the first and second sections of windings; and providing first and second magnetic flux conducting operators in a spaced apart relation from the respective first and second core ends.” Reinicke neither describes nor suggests a method of splitting the flux path of a single coil two operator controller, wherein the method includes enclosing a core in a coil such that the coil is wound around a first and second section of the core with a flux conducting divider between the first and second winding sections, and wherein the core is placed in a spaced apart relation with a first and second flux conducting operator. Rather Reinicke describes a central portion of a generally U-shaped core including two spaced downwardly directed magnetic legs. Each of the legs interconnected by the central portion about which a coil is developed. Conversely, the coil of the present invention is described to enclose a portion of a core in spaced apart relation to a first and second operator. Additionally, Reinicke describes a single electrical winding developed around a central portion of the U-shaped core, wherein exciting the winding concurrently opens two valves. Reinicke does not describe or suggest a coil wound around a first and second section of the core with a conducting divider between the first and second winding sections. For at least these reasons, Applicants submit that claim 33 is patentable over Reinicke.

For the reasons set forth above, Applicants respectfully submit that the invention set forth in claims 1-5, 8-10, 25-26, and 30 would not have been obvious from Reinicke, and that the Section 103 rejection to claims 1-5, 8-10, 25, 26, and 33 should be withdrawn.

Applicants have amended claim 3 to change “send” to “end” to correct a typographical error. Applicants have amended claim 17 to replace “second” with “secondary” on lines 31 and 36, to correct a typographical error. Applicant has amended the claims to correct errors in dependencies in claims 5, 6, 7, 9, 10, 11, 12, 18, 19 20, 2, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 34, 35, and 36.

The objection to claims 6, 7, 11-16, and 34-36 is respectfully traversed.

With respect to claims 6 and 7, claims 6 and 7 depend indirectly from claim 2 which has been submitted to be patentable. When the recitations of claims 6 and 7 are considered in combination with the recitations of claim 2, Applicants respectfully submit that claims 6 and 7 are likewise patentable.

With respect to claims 11-16, claims 11-16 depend, directly or indirectly, from claim 8 which has been submitted to be patentable. When the recitations of claims 11-16 are considered in combination with the recitations of claim 8, Applicants respectfully submit that claims 11-16 are likewise patentable.

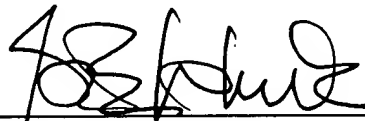
With respect to claims 34-36, claims 34-36 depend directly from claim 33 which has been submitted to be patentable. When the recitations of claims 34-36 are considered in combination with the recitations of claim 33, Applicants respectfully submit that claims 34-36 are likewise patentable.

For the reasons set forth above, the Applicant requests that the objection to claims 6, 7, 11-16, and 34-36 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now pending in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

If it would advance the prosecution of this application, the Examiner is invited to telephone the undersigned.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "B. Wheelock", written over a horizontal line.

Bryan K. Wheelock
Registration No. 31,441
HARNESS, DICKEY & PIERCE P.L.C.
7700 Bonhomme, Suite 400
St. Louis, MO 63105
(314) 726-7500
(314) 726-7501 (Facsimile)

APPENDIX A
ATTACHMENT SHOWING AMENDMENTS TO THE CLAIMS
PURSUANT TO 37 C.F.R. 1.121(c)(1)(ii)

3. (Amended) The operator according to claim 2 wherein the second end of each sleeve is closed, and wherein the bar has a recess therein for receiving the closed second ~~[send]~~ end of each sleeve.

5. (Amended) The operator according to claim [2] 4 further comprising a return between the first and second winding sections, extending substantially between the plate and the bar.

6. (Amended) The operator according to claim [3] 5 wherein the return comprises in an U-shaped member, oriented so that the ends of the legs of the "U" are adjacent the plate, and the bottom of the "U" extends over the bar.

7. (Amended) The operator according to claim [4] 6 wherein the plate has cutouts for receiving the ends of the legs of the "U".

9. (Amended) The gas valve according to claim [7] 8 wherein the coil comprises first and second winding sections connected in series and separated by a gap.

10. (Amended) The gas valve according to claim [8] 9 further comprising a return between the first and second winding sections, extending substantially between the plate and the bar.

11. (Amended) The gas valve according to claim [9] 10 wherein the return comprises in an U-shaped member, oriented so that the ends of the legs of the "U" are adjacent the plate, and the bottom of the "U" extends over the bar.

12. (Amended) The gas valve according to claim [10] 11 wherein the plate has cutouts for receiving the ends of the legs of the "U".

17. (Amended) A single coil split flux path electromagnetic two operator controller comprising:

a core element made of magnetic flux conducting material and having opposite first and second ends defining a length of the core element there between;

a single coil winding, the winding being wrapped around the core element along a portion of the length of the core and having first and second ends, the winding being configured to magnetize said core element and create an electromagnet when energized by passing an electrical current through the winding, said electromagnet creating a magnetic field and an associated flux path when energized, the core being part of the flux path and the first and second ends of the core element being respective first and second poles of said electromagnet;

first and second operators made of magnetic flux conducting material, said operators each being movable between independent first and second positions and being biased so that when the electromagnet is not energized the operators are in their respective first positions;

a support member supporting the electromagnet so that the first and second poles of the electromagnet are in a spaced apart relation from the respective first and second operators and within the flux path of the electromagnet along with the first and second poles, the first and second operators being attracted to the respective first and second poles and moving from their respective first positions to their respective second positions when the electromagnet is sufficiently energized;

a base made of magnetic flux conducting materials, the base separating the first and second operators and being part of the flux path when the electromagnet is energized; and

a flux divider made of magnetic flux conducting material, the flux divider separating the winding into the primary and secondary windings, and thereby separating the flux path into respective primary and secondary flux paths, the flux divider extending to a location on the base between first and second operators, the primary flux path generally going from the first pole through the first operator through the base through the flux divider through the core within the primary winding and back to the first pole, the [second] secondary flux path generally going from the core element within the secondary winding through the flux divider through the base through the second operator through the second pole and back to the core within the secondary winding,

the primary winding being sized to generate sufficient flux to pull the first operator towards the first pole and into the first operator's second position when the electromagnet is energized, the [second] secondary winding being sized to generate sufficient flux to pull the second operator towards the second pole and into the second operator's second position when the electromagnet is energized.

18. (Amended) The controller of claim [1] 17, wherein:
the single coil winding is wound on a bobbin, the bobbin having first and second ends defining a length of the bobbin there between and a hollow interior bore between the first and second ends, the interior bore being dimensioned to allow the core element to fit inside the interior bore, the winding covering a portion of the length of the bobbin and the core element being within the interior bore of the bobbin with the first and second core ends extending beyond the winding on the bobbin, the winding, bobbin and core element thereby forming the electromagnet when energized.

19. (Amended) The controller of claim [17] 18, wherein:
the bobbin has an integral switch, the switch being selectively adjustable between on and off positions, the switch is electrically connected to the winding and has connection members for electrically connecting the switch to an electric current source to energize the electromagnet, the switch separating the electric current source from the winding and allowing current to flow through the winding when in the on position and preventing current from flowing through the winding when in the off position.

20. (Amended) The controller of claim [17] 18, wherein:
the bobbin has an integral rectifier electrically connected to the winding and separating the winding from a current source, the rectifier having connection elements for electrically connecting to a current source to energize the electromagnet, the rectifier, when connected to an alternating current source, converting the alternating current to a direct current to thereby energize the electromagnet with direct current.

21. (Amended) The controller of claim [17] 18, wherein:
the core element has a cross-sectional shape perpendicular to the core length that is generally circular and the bobbin has a cross sectional shape perpendicular to the bobbin length that is generally circular.

22. (Amended) The controller of claim [20] 21, wherein:

the flux divider is generally U-shaped and is positioned around the generally circular cross-section of the bobbin so that the flux divider encircles approximately 180 degrees of the generally circular cross-section and extends to the base.

23. (Amended) The controller of claim [16] 17, wherein:

The [supporting] support member is comprised of a pair of legs, the pair of legs being first and second legs, and extending to the respective first and second poles of the electromagnet, the first leg having a hollow interior dimensioned to allow the first operator to fit inside the first leg and move from the first operator's first position to the first operator's second position while inside the first leg, and the second leg having a hollow interior dimensioned to allow the second operator to fit inside the second leg and move from the second operator's first position to the second operator's second position while inside the second leg.

24. (Amended) The controller of claim [16] 17, wherein:

The flux divider extends through the base and makes contact with the base when the electromagnet is energized.

26. (Amended) The controller of claim [24] 25, wherein:

a bobbin surrounds a portion of the rod and the coil encloses a portion of the bobbin, the rod and coil being inductively coupled and making an electromagnet when the electrical current is passing through the coil.

27. (Amended) The controller of claim [24] 25, wherein:

a switch is electrically connected to the coil and separates the coil from the current source, the switch being selectively positionable between open and closed positions and having electrical connectors adapted to be connected to the current source, the switch preventing current from flowing through the coil when in the open position and allowing current to flow through the coil when in the closed position.

28. (Amended) The controller of claim [24] 25, wherein:

A rectifier is electrically connected to the coil and separates the coil from the current source, the rectifier having electrical connectors adapted to be connected to the current source and converting an alternating current to direct current when connected to an alternating current source.

29. (Amended) The controller of claim [24] 25, wherein:

the first plunger is connected to a valve and when the first plunger is moved between the two positions, the valve opens and closes.

30. (Amended) The controller of claim [28] 25, wherein:

the second plunger is connected to a second valve and when the second plunger is moved between the two positions, the second valve opens and closes.

31. (Amended) The controller of claim [29] 25, wherein:

the divider has a closed end and an open end and is generally U-shaped and the base has at least one slot, the closed end being positioned around a portion of the rod and the open end extending through at least one slot in the base, the divider being in contact with the base when the electrical current is passing through the coil.

32. (Amended) The controller of claim [24] 25, wherein:

the divider passes through the base and is in contact with the base when the electrical current is passing through the coil.

34. (Amended) The method of claim [32] 33, further comprising the step of:

providing a switch electrically connected to the coil and separating the coil from an electrical current source, the switch being selectively adjustable between on and off positions and having electrical connectors adapted to be connected to the electrical current source, the switch preventing current from flowing through the coil when in the off position and allowing current to flow through the coil when in the on position.

35. (Amended) The method of claim [32] 33, further comprising the step of:

providing a rectifier electrically connected to the coil and separating the coil from an electrical current source, the rectifier having electrical connectors adapted to be connected to the electrical current source and converting alternating current to direct current when connected to an alternating current source.

36. (Amended) The method of claim [32] 33, further comprising the step of:

sizing the first sections of winding to provide sufficient flux to pull the first operator from the biased position to the non-biased position when an electrical current is passed through the coil; and

sizing the second section of winding to provide sufficient flux to pull the second operator from the biased position to the non-biased position when the electrical current is passing through the coil.